

26. *LEPUS ARABICUS* Hempr. & Ehr.

- a. ♂. Shaka, 29th August.
 b. Hiswa, 20th September.
 c. Young. La Mileh, 16th August.

"Fairly common in the more fertile wadis, but extremely difficult to shoot—unless you have a good camel that will stand when you tell it to: then, by following as quickly as possible among the bushes, one can get them. I only shot 4 all the time I was out. Breeding-time must be about October, as the female got at Sheikh Othman late in September was in kindle, 6 young ones."

27. *PROCAVIA SYRIACA JAYAKARI* Thos.

- a. Abyan Mountains, 70 miles N.E. of Aden.

This is the first Dassy obtained in the Aden region, the previous examples of the subspecies having come from Dofar, halfway towards Muscat (*Jayakar*), and from Nejd in Central Arabia (*Schweinfurth*).

"*Hyrax*.—Not rare in the hills behind Shukra, but very difficult to get within shot, as the Bedouins are always hunting them for food; I saw 20 or more in one place, but they all cleared before I got within 100 yards. I saw a lot of snares set for them, but while I was in the district none were captured: the snares were set in the mouth of a hole. The hyrax is not much of a wanderer and feeds close to his hole. There are two species of Eagle about the hills which subsist almost entirely on them, so they have plenty of foes. According to a Bedouin from Dethina¹, the Leopards live to a large extent on Dassies, which seem to be very common in Dethina, and Leopards are fairly numerous."

28. *CAPRA SINAITICA* Hempr. & Ehr.

- a. Skull and horns. Abyan Mountains.

3. A Revision of the Butterflies of the Genus *Zizera* represented in the Collection of the British Museum. By
 ARTHUR G. BUTLER, Ph.D., F.L.S., F.Z.S. &c.

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(Plate XI.)

Whilst rearranging the Museum series of "Blues" referable to the genus *Zizera*, I have discovered so much of interest, that, although at present I am not prepared to assert that the genus is a good one (when examined structurally), I feel that a revision of it is greatly needed.

In De Nicéville's 'Butterflies of India,' a work of great merit and therefore deserving of all respect, I find certain species regarded as synonyms which to me appear to be as distinct as

¹ Dethina lies some 200 miles N.E. of Aden.

Butterflies inhabiting different geographical areas can well be; yet I find the decisions arrived at by De Nicéville echoed by Leech in his 'Butterflies of China and Japan.'

The question which naturally occurs to me is: Did these gentlemen ever separate the whole of the specimens before them into geographical forms before deciding that they represented one widespread and variable species? If they had done so, I cannot avoid the conclusion that they would either have kept them separate, or have included the whole genus under one widely distributed and still more variable species.

The genus *Zizera* consists of small Butterflies with naked eyes; the hind wings rounded, without tail, never ocellated above or below; the costal and subcostal veins perfectly free (on which account I cannot accept the *Lycæna lulu* of Mathew as a *Zizera*, since the costal and first subcostals touch one another in that species and the hind wings usually show a black spot below to represent an ocellus).

I am not at all sure that *Z. labradus*, in which the costal vein and first subcostal branch of the fore wings are closely approximated (though they do not touch or unite), is very nearly related to any of the other species of the genus, the position of the discal series of spots on the fore wings being unique; still there seems no sufficient reason for rejecting it from the genus or group known as *Zizera*.

Before proceeding to a key to the species of *Zizera*, I wish to express my conviction that any errors which may have crept into important faunistic works with regard to the clear definition of the species have been largely due to errors of identification published previously, and almost inevitable at a time when the seasonal phases of species were not even guessed at: thus a wet phase from Calcutta might somewhat resemble a wet phase from Japan, whilst the dry phase was wholly dissimilar.

Key to Species of *Zizera*.

- A. Hind wings with first three spots of discal series below forming a tolerably regular oblique line
- a. Species with well-defined and very dissimilar seasonal forms.
- a. a. Wet phase of male silvery violet above with very broad outer border, of female brown; both sexes brownish grey below: dry phase, bluish white above, the female with very broad outer border *Z. maha*.
- a. b. Wet phase of male lavender above with much narrower outer border, of female brown; both sexes greyish stone-colour below: dry phase pale lavender shading into silvery blue above, the female with moderately broad border (as in male of wet phase)..... *Z. diluta*.
- a. c. Wet phase of male pearly lilac above, with border as in a. b, but more sharply defined, of female brown; both sexes greyish stone-colour below: dry phase silvery blue, becoming pale lilac and then cream-white, with veins of the latter colour, the female blue with broad border to primaries extending along costa; a broad costal border to secondaries *Z. opalina*.

- a. d.* Wet phase of male rich lavender, with moderately broad sharply defined blackish border; of female brown; both sexes greyish white below, with the markings very dark: dry phase rich lilacine blue, with blackish margin and fringe, the female black-brown sprinkled with blue scales; both sexes below brownish grey..... *Z. argia.*
- b.* Species with ill-defined seasonal forms.
- b. a.* A spot within discoidal cell of front wings below, discal spots sinuous.
- b. a. a.* Upper surface of male rich violet, with very broad dark brown outer border *Z. lysimon.*
- b. a. b.* Brown outer border on upper surface one third narrower, fringes of all the wings frequently whitish externally *Z. knysna.*
- b. a. c.* Generally smaller, with ill-defined browner outer border. Males above lilac with coppery reflections, outer border reduced to a dark marginal line; underside ashy, all the markings dark and well-defined; a white streak along discoidal vein of hind wings ... *Z. karsandra.*
- b. a. d.* Ill-defined but very dark brown outer border above; the discoidal and discal black spots below all very large and white-edged, the last two or three discal spots of front wings wanting *Z. atrigenmata.*
- b. b.* No spot within discoidal cell of front wings..... *Z. gaika.*
- b. c.* Discal spots on underside of front wings forming a nearly straight line, inner row of spots wanting from hind wings *Z. lorquini.*
- B.** Hind wings with first three spots of discal series below forming a triangle, the first and second being almost in a transverse line.
- a.* Discal series of markings crossing the under surface near to submarginal series.
- a. a.* Male above dull lavender, border brown, rather narrow and ill-defined, markings below usually pale... *Z. labradus.*
- a. b.* Male above lilacine, border apparently broad and diffused on apical-costal area; markings below broader and well-defined, but brown..... *Z. caduca.*
- a. c.* Male above bluish green, with broad outer border; all the markings on the underside well-defined..... *Z. antanossa.*
- a. d.* Male above often bluish green, sometimes brown; the spots below small, the discal series of front wings nearly straight, the inner series of hind wings very imperfect *Z. minima.*
- a. e.* Male above violet, with distinct rather narrow border, widening on costa of front wings; spots below small *Z. otis.*
- a. f.* Male above similar, but the border often narrower; discal spots below large *Z. indica.*

The following is a list of the species represented in the Museum:—

1. *ZIZERA MAHA.* (Plate XI. figs. 1, 2.)

Lycæna maha, Kollar in Hügel's Kaschmir, iv. p. 422 (1848).

Polyommatus chandala, Moore, P. Z. S. 1865, p. 504, pl. xxxi. fig. 5.

Zizera ossa, Swinhoe, P. Z. S. 1885, p. 132, pl. ix. figs. 11, 12.

This species appears to be strictly confined to Western India,

occurring from the Lower Himalayas to Madras. In my opinion, *Z. maha* is the wet phase, *Z. chandala* intermediate, *Z. ossa* dry.

Although Mr. Moore describes *Z. chandala* as having a purplish-brown border and the figure represents an insect with a very dark and defined border, the dull silvery-blue colouring mentioned in the description can only apply to the intermediate phase; in the wet phase the border is much broader and there is a distinctly violet subtint.

The intermediate phase somewhat nearly resembles the wet phase of *Z. diluta*, to which fact I believe the confusion between these geographically constant forms is attributable; the males, however, are somewhat paler and more pearly in tint, with the dark outer border to the primaries browner and consequently less sharply defined.

It is possible that this species may range through Beluchistan to the Persian Gulf, as we have a female from Fao which looks suspiciously like that sex of *Z. maha*.

2. ZIZERA DILUTA. (Plate XI. figs. 3, 4.)

♂. *Lycæna diluta*, Felder, Reise der Nov., Lep. ii. p. 280, pl. xxxv. figs. 12, 13 (1865).

♀. *Lycæna squalida*, Butler, Trans. Ent. Soc. Lond. 1879, p. 41.

The range of this species seems to extend from the Eastern Himalayas southwards to Ganjam; and the differences which separate this geographical race from the Western *Z. maha* appear to me to be quite constant, such as the narrower and better defined outer border to the wings and the greater resemblance of tint between the seasonal phases. At the same time, to those who prefer to treat it as a form of *Z. maha*, I have nothing to object; only I hope that they will not, as we have all done hitherto, confound the Eastern and Western types.

3. ZIZERA OPALINA. (Plate XI. figs. 5, 6.)

Lycæna opalina, Poujade, Ann. Soc. Ent. France, 1885, p. cxliii.

Lycæna marginata, Poujade, tom. cit. p. cli.

Plebeius alboceruleus, Röber, Iris, iii. p. 59, pl. iv. fig. 7 (1886).

This pretty little species probably occurs throughout Burma¹, Tibet, and China. The wet phase of the male is distinctly more pearly and apparently more lilacine than in either of the Indian forms: this may, however, be partly due to the darker and slightly narrower outer border of the primaries; that of the secondaries is represented along outer margin by a row of well-defined black spots, sometimes bounded internally by a lunulated line: the under surface has a yellower (more stone-coloured) tint than in *Z. maha* or *Z. diluta*. The dry phase is very distinctive, the colouring of the

¹ We have a male of the dry phase collected by the late Capt. Watson in the Southern Shan States.

males being silvery sky-blue, fading on the borders into creamy white and with similarly coloured veins.

4. *ZIZERA ARGIA*. (Plate XI. figs. 7, 8.)

Lycæna argia, Ménétrés, Cat. Mus. Petrop. ii. p. 125, pl. x. fig. 7 (1857)

Lycæna japonica, Murray, Ent. Month. Mag. xi. p. 167 (1874); Pryer, Rhop. Nihon. pl. iv. fig. 24c (1886).

Lycæna alope, Fenton, P. Z. S. 1881, p. 351.

Occurs in Mantchuria, Corea, and throughout Japan. The male of the wet phase somewhat nearly resembles the same phase of *Z. diluta*, but the much whiter under surface with sharply defined black spotting would separate the two insects at a glance: the dry form (*Z. japonica*) first induced me to conclude that the association of the four preceding geographical forms together under one specific name must be an error; it, in fact, resembles none of the other dry forms, the upper surface of the male being of a rich lavender-blue, with the extremities of the veins and a very narrow marginal line dark brown, the under surface, unlike its wet phase, being brownish grey.

When the wet phases only of these four species are compared, one is tempted to think that they may be varietal forms of the same species; but all the dry phases are perfectly distinct. No lepidopterist who possessed only *Z. ossa* and *Z. japonica* would for a single moment hesitate to regard them as evidently distinct species. As I hold that a species is represented by all its forms, and not by one alone, I should still consider the preceding species distinct if they showed no difference whatever at the wet season, so long as their dry phases exhibited such well-defined characteristics.

5. *ZIZERA LYSIMON*. (Plate XI. fig. 9.)

Papilio lysimon, Hübner, Eur. Schmett. i. pl. cv. figs. 534, 535 (1791-1803).

Southern Europe.

Staudinger notes Mauritania and Asia Minor as localities, but I should hesitate to accept these without first examining specimens and comparing them with those of the south of France or Spain. De Nicéville quotes *Lycæna galba* as a synonym, but Staudinger widely separates the two in his catalogue. From *Z. knysna*, to which it is allied, *Z. lysimon* differs in its duller less clear violet colouring and considerably broader brown borders. What species Mr. De Nicéville identified as *Z. lysimon* in India I cannot guess: *Z. karsandra* is the nearest; but, although the illustration which he gives of a female seems to me to represent some females of the latter species, the fact that he comments upon my quoting it as *Z. karsandra* from the Malay Peninsula seems to hint at its being something different. One thing, however, is certain—*Z. karsandra* is much more nearly allied to *Z. knysna* than the latter is to *Z. lysimon*.

6. ZIZERA KNYSNA. (Plate XI. fig. 10.)

Lycæna knysna, Trimen, Trans. Ent. Soc. Lond. ser. 3, vol. i. p. 282 (1862); Rhop. Afr. Austr. ii. p. 255 (1866).

Sierra Leone southwards to the Cape, thence all along the eastern side to Abyssinia; also at Aden.

7. ZIZERA KARSANDRA.

Polyommatus karsandra, Moore, P. Z. S. 1865, p. 505, pl. xxxi. fig. 7.

Zizera mora, Swinhoe, P. Z. S. 1884, p. 506, pl. xlvii. fig. 7.

Western and Southern India, Ceylon, Burma, Penang, the Philippines, and New Guinea.

I have no doubt that the specimens recorded from Aden are referable to *Z. knysna*, from which *Z. karsandra* certainly differs less than the species of the *Z. maha* group. *Z. mora* is an aberration.

8. ZIZERA ATRIGEMMATA. (Plate XI. fig. 11.)

Lycæna atrigemmata, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. ii. p. 290 (1878).

Madagascar.

The enormous size of the black spots on the under surface at once defines this species: we possess only two examples, therefore it may prove to be an aberrant form, but it is hardly likely that two aberrations and none of the normal form would be obtained.

9. ZIZERA GAIKA.

Lycæna gaiika, Trimen, Trans. Ent. Soc. 3rd ser. i. p. 403 (1862); Rhop. Afr. Austr. ii. p. 256, pl. 4. fig. 7 (1866).

Lycæna pygmæa, Snellen, Tijd. voor Ent. xix. p. 153, pl. 7. fig. 3 (1876).

From Damara-land and the Cape, north-eastwards probably to Cape Guadafui, Aden, Muscat, and probably through Persia and Afghanistan to India, the Western Himalayas, continental and peninsular India, Ceylon, Burma, the Malay Peninsula, Andaman Islands, Sumatra, and Java.

10. ZIZERA LORQUINI.

Lycæna lorquini, Herrich-Schäffer, Schmett. Eur. i. figs. 442-4 (1850).

South of France and Andalusia.

How this species ever came to be regarded as the same as *Z. minima* is a puzzle to me; the lilac colouring of the upper surface is so utterly dissimilar from the greenish-scaled brown upper surface of *Z. minima* that one would never expect to see them put together; even the pattern of the under surface, though somewhat similar, differs considerably.

11. ZIZERA LABRADUS. (Plate XI. fig. 13.)

Polyommatus labradus, Godart, Enc. Méth. ix. p. 680 (1819).

Lycæna novæ-hollandiæ, Felder, Verh. zool.-bot. Ges. Wien, xii. p. 490 (1862).

Lycæna communis, Herrich-Schäffer, Stett. ent. Zeit. 1869, p. 72 (undescribed).

Lycæna alsulus, Herrich-Schäffer, t. c. p. 75.

Zizera phœbe, Murray, Ent. Mo. Mag. x. p. 107 (1873).

Lycæna mangoensis Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. xiii. p. 347 (1884).

The South Pacific Islands, Tasmania, Australia, Damma Island, and perhaps Amboina.

I do not think there is at present sufficient evidence of the identity of *Z. caduca* with *Z. labradus*: the type differs considerably from any specimens of *Z. labradus* which we possess. A single example obtained by Mr. J. J. Walker in Amboina must, I think, be referable to *Z. labradus*; it differs chiefly in the sharply defined markings on the under surface, those crossing the disk of the wings being almost black.

12. ZIZERA CADUCA. (Plate XI. fig. 12.)

Lycæna caduca, Butler, P. Z. S. 1875, p. 616.

Erromanga, New Hebrides.

This is decidedly smaller than any *Z. labradus* that I have seen, and the dark external border (of the female at any rate) is extremely broad on the costal half of the wing, where it extends to the end of the discoidal cell: in the secondaries the submarginal pale lunules are sharply defined, and on the under surface all the inner markings are considerably broader than in *Z. labradus*, being equal in width to those of the submarginal series. I cannot, therefore, at present follow my friend Mr. H. H. Druce in regarding *Z. caduca* as a variety.

13. ZIZERA ANTANOSSA. (Plate XI. figs. 14, 15.)

Lycæna antanossa, Mabille, Bull. Soc. Ent. France, ser. 5, vol. vii. p. lxxii (1877).

Madagascar, Eastern, Southern, and Western Africa.

The male of this species more nearly resembles the most highly coloured forms of *Z. minima* on the upper surface than it does any other species; on the under surface, however, it is very different, the discal series of spots on the primaries being sinuous and all the spots larger; a well-defined double submarginal series.

14. ZIZERA MINIMA.

Papilio minimus, Fuessly, Verz. p. 31 (1775).

Papilio alsus, Schiffermüller, Wien. Verz. p. 184 (1776).

Papilio minutus, Esper, Schmett. i. pl. 108. fig. 8 (1800?).

Lycæna alsoides, Gerhardt, Mon. Lyc. pl. 13. fig. 3 (1853).

Europe. "Asia Minor, Armenia, S. Siberia, Amur" (*Staudinger*).

